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PATENT
Docket No.: P-8035.00US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Kevin J. Kelly et al.
Patent No.: 6,820,019 B1
Issued: November 16, 2004
For: DEVICE AND METHOD FOR DETERMINING AND COMMUNICATING
THE REMAINING LIFE OF A BATTERY IN AN IMPLANTABLE
NEUROLOGICAL TISSUE STIMULATING DEVICE

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Anne M. La Dow

TRANSMITTAL LETTER

Attn: Certificate of Correction Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Certificate
FEB 24 2005
of Correction

Enclosed for filing in the above-identified application are the following:

- ☒ Request for Certificate of Correction of Patent for PTO Mistake
- ☐ Request for Certificate of Correction of Patent for Applicant Mistake
 - ☐ The Commissioner is hereby authorized to charge \$100 for the Certificate of Correction fee to Deposit Account No. 13-2546. A duplicate of this Transmittal Letter is enclosed.
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Respectfully submitted,

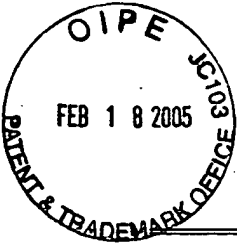
Date:

2-15-05

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FEB 28 2005

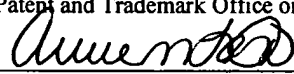


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Anne M. La Dow

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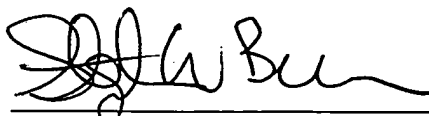
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Respectfully submitted,

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AN IMLANTABLE NEUROLOGICAL TISSUE STIMULATING
DEVICE

REQUEST FOR CERTIFICATE OF CORRECTION OF PATENT
FOR PTO MISTAKE (37 CFR 1.322(a))

Attn: Certificate of Correction Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

It is requested that a Certificate of Correction be issued correcting printing errors appearing in the above-identified United States patent. The text of the Certificate of Correction in the suggested format is enclosed.

As none of the errors listed is due to Applicant's mistake, no fee is necessary in connection with this Request.

The exact page and line number where the errors are shown correctly in the application file are:

<u>Location</u>	<u>Error in Patent</u>	<u>Correctly shown in application file</u>
Patent Column 9, Line 48	"...capacitor;"	"...capacity;"
Patent Column 9, Line 49	"...calculating use"	"...calculating, using"

Please send the Certificate to:

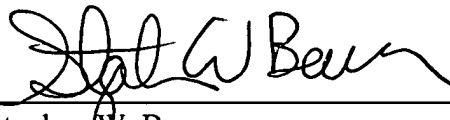
Stephen W. Bauer
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Minneapolis, Minnesota 55432-5604

The name of the assignee is Medtronic, Inc. The assignment was recorded on 09/17/1999
at Reel 010270, Frame 0787.

Respectfully submitted,

Date:

2-15-05



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FEB 28 2005

UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO. : 6,820,019 **B1**
DATED : November 16, 2004
INVENTOR(S) : Kevin J. Kelly; Nathan A. Torgerson

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Patent Column 9, Line 38 reads "...capacitor;" but should read "...capacity;"

Patent Column 9, Line 49 reads "...calculating use" but should read "...calculating, using"

MAILING ADDRESS OF SENDER:

PATENT NO. 6,820,019

Medtronic, Inc.
710 Medtronic Parkway NE
Minneapolis, MN 55432

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This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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5. The method of claim 1 wherein the step of determining the remaining life of the power source includes the step of determining the probable usage rate of the power source.

6. The method of claim 5 wherein the step of determining the probable usage rate of the power source includes the step of determining the used capacity of the power source.

7. The method of claim 6 wherein the step of determining the probable usage rate of the power source includes the step of dividing the determined used capacity of the power source by the length of time that the implantable medical device has been working.

8. The method of claim 5 wherein the step of determining the probable usage rate of the power source includes the step of determining the used capacity of the power source since the last time the implantable medical device was reprogrammed.

9. The method of claim 8 wherein the step of determining the probable usage rate of the power source includes the step of dividing the determined used capacity of the power source since the last time the implantable neurological tissue stimulator was reprogrammed by the length of time since the implantable medical device was reprogrammed.

10. The method of claim 1 wherein the step of determining capacity information of the power source includes the step of correlating, in a "look-up table", the power source voltage assessed in the step of assessing the power source voltage to a predetermined "power source capacity remaining" value.

11. The method of claim 1 wherein the step of determining capacity information of the power source includes the step of correlating, in a "look-up table", the power source voltage assessed in the step of assessing the power source voltage to a predetermined "power source capacity used" value.

12. The method of claim 1 wherein the step of determining capacity information of the power source includes the step of determining the power source capacity used and then subtracting this value from the total power source capacity; whereby, the power source capacity remaining is determined.

13. The method of claim 1 wherein the step of determining capacity information of the power source includes the step of determining the power source capacity remaining and then subtracting this value from the total power source capacity;

whereby, the power source capacity used is determined.

14. The method of claim 1 wherein the step of determining capacity information of the power source includes the step of calculating use the voltage of the power source determined in the step of assessing the voltage of the power source, the remaining power source capacity by a formula.

15. A method of determining the current status and remaining life of a power source in an implantable medical device comprising the steps of:

assessing the power source voltage of the power source in an implantable medical device;

determining, based on the assessed power source voltage, where the power source is in its power source life cycle by calculating the remaining power source capacity by using a formula of the form: Remaining Battery Capacity=a constant+a constant multiplied by the power source voltage determined in the step of assessing the power source voltage of the power source in an implantable medical device; and

taking appropriate action in response to the determination of where the power source is in its power source life cycle.

16. The method of claim 14 wherein the step of calculating the remaining power source capacity by a formula includes the step of calculating the remaining power source capacity by using a non-linear formula.

17. A method of determining the current status and remaining life of a power source in an implantable medical device comprising the steps of:

assessing the power source voltage of the power source in an implantable medical device;

determining, based on the assessed power source voltage, where the power source is in its power source life cycle by calculating the power source capacity by using a formula of the form: power source capacity used=a constant+a constant multiplied by the power source voltage determined in the step of assessing the power source voltage of the power source in an implantable medical device; and

taking appropriate action in response to the determination of where the power source is in its power source life cycle.

18. The method of claim 1 further comprising the step of informing the user of the status of the power source.

19. The method of claim 18 wherein the step of informing the user includes the step of displaying a representation of the percentage of power source capacity used.

20. The method of claim 18 wherein the step of informing the user includes the step of displaying a representation of the percentage of power source capacity remaining.

21. The method of claim 18 wherein the step of informing the user includes the step of determining whether the remaining power source capacity falls within a predetermined limit.

22. The method of claim 21 wherein the step of determining whether the remaining power source capacity falls within a predetermined limit further includes the step of alerting the user if the remaining power source capacity falls within a predetermined limit.

23. The method of claim 22 wherein the step of alerting the user if the remaining power source capacity falls within a predetermined limit further includes the step of alerting the user by triggering an alarm.

24. The method of claim 23 wherein the step alerting the user by triggering an alarm includes the step of triggering an alarm chosen from the group consisting of audible or visual warnings.

25. A device for determining the status and remaining life of a power source in an implantable neurological tissue stimulator, device comprising:

an implantable neurological tissue stimulator, the implantable neurological tissue stimulator having:

a source of power having a voltage;

a voltage determining system for determining the voltage of the source of power through actual measurement;

a programmer for creating and processing information to be sent to and received from the implantable neurological tissue stimulator, the programmer including a processor and a memory attached thereto;

a system for communicating information between the implantable neurological tissue stimulator and the programmer;

wherein the voltage determining system passes the voltage of the source of power to the system for communication; and

wherein the system for communication passes the voltage of the source of power from the implantable neurologi-